Amaranth FarmFacts

Produced by Saskatchewan Agriculture and Food and Saskatchewan Rural Development

Amaranth is an ancient pseudo-cereal that originated in South and Central Americas. It was grown extensively during the height of the Aztec civilization in Mexico in the fifteenth century. It can be used as a high-protein grain or as a leafy vegetable, and has potential as a forage crop.

The most common use for grain amaranth is to grind the grain into a flour for use in breads, noodles, pancakes, cereals and cookies. The grain can be popped like popcorn or flaked like oatmeal. More than 40 products containing amaranth are currently on the health food market in the United States.

Amaranth has several nutritional qualities which contribute to its use by the health food market. The grain has 12 - 17% protein, and is high in lysine, an essential amino acid in which cereal crops are low. The grain is high in fiber and low in saturated fats. Recent studies have linked amaranth to a reduction in cholesterol levels in laboratory animals. Amaranth contains tocotrienais which have cholesterol-lowering activity in humans.

The two species of grain amaranth commonly grown are **Amaranthus cruentus** and **Amaranthus hypochondriacus.** They are related to redroot pigweed, but are different species and have not become weeds in fields where they have been grown. The grain amaranths have large colorful seed heads and can yield over 200 - 1000 lbs. of grain per acre on dryland. The plants are about five to seven feet tall when mature. The tiny, lens-shaped seeds are one millimeter in diameter and are usually white to cream colored.

Research on amaranth by Canadian agronomists began in the 1980's, so optimum production guidelines and uniform, adapted varieties have not yet been developed. **Amaranthus cruentus** seems best adapted to Montana; tests at Morden, Manitoba are just underway.

Adaptation

Amaranth is reportedly drough-tolerant, similar to sorghum, provided there is sufficient moisture to establish the crop. Amaranth performed well in the drought conditions of 1989 in southern Manitoba. Amaranth responds well to high sunlight and warm temperatures.

In Southern Manitoba it is usually sown in early May and harvested in late September. That is, currently available varieties require a full season to reach maturity. It may not mature completely in the Prairies' growing season. A frost is necessary to kill the crop so it will be dry enough to harvest.

Seeding

The planting date for amaranth should be as early as possible because it needs a long growing season. Amaranth requires a fine seed bed which must be firmed to provide the extremely small seed with good soil contact to provide moisture. The seed requires a soil temperature of 65° to 75° F for maximum speed of germination. If given optimal conditions of temperature and soil moisture, seed germination will occur in four to six days. Soil crusting can be a problem to plant establishment due to the small seed (1,000 seeds weigh less than 1 gram). A seeding rate of 1 to 2 lbs/acre is recommended by Montana State University.

Amaranth is best planted with vegetable planter. On a standard grain drill box the drill speed should be decreased with the reducer sprocket. While amaranth seeds should ideally be planted ¼ inch deep, plant depths of close to ½ inch (which does delay and lower seedling emergence) may be more realistic for adequate seed and soil contact. Equipping the drill with packer wheels will improve the soil and seed contact.

If the amaranth crop is to be grown under irrigation, it is recommended that the crop be irrigated immediately after planting. If crusting occurs, a second irrigation could be applied.

Weed Control

No herbicides are labeled for use with amaranth. Weeds must be controlled by cultivation. Hand removal of weeds in extremely weedy fields may be necessary since weed seeds in the harvested crop can be a significant problem. Pigweed hybridizes with grain amaranth. Pigweed plants in the vicinity of an amaranth field should be eliminated before flowering time.

Diseases and Insects

Researchers and growers have not seen major disease problems. Damping off of young seedlings and stem canker may occur. Tarnished plant bug and flea beetle are potentially significant insect pests of amaranth.

Harvest and Cleaning

In Manitoba, grain amaranth plants mature in mid-September. Amaranth stems and leaves remain high in moisture content until they are partially killed by frost and dry up.

In Montana, grain cleaning has been achieved by using either a clover or alfalfa screen for seed separation. However, the quality of seed cleaning

will depend on the moisture content of the plant at harvest time. Generally the combine will be operated at a slower ground speed as compared to cereal grain harvest. The cylinder clearance and speed and fan adjustments must be specifically set for optimum threshing success.

Excess chaff and plant residues will not only interfere with grain drying but can also increase the possibilities of grain molds and insect attraction which can impart undesirable flavors in the flour. Cleaning of the small-seeded amaranth grain must be done carefully so that loss of grain will be kept to a minimum. Dirt particles can be removed with an alfalfa scarifier or alfalfa rubber clay rollers.

Grain Drying and Storage

Amaranth grain must be dried to 10-12% moisture for prolonged storage and good product shelf life. The Rodale Research Center, Kutztown, Pennsylvania, suggests that amaranth should not be grown unless provisions can be made for drying the grain. Grain dryers must be modified to dry the small amaranth seed. A five-mesh nylon sheet placed over the perforated floor of the dryer has been used successfully to dry the amaranth grain. Dry storage conditions are required to maintain a good quality grade of grain.

Marketing

Markets for amaranth are small and fragile. The primary market is the human specialty food industry. Growers should identify a market, or have a contract before planting amaranth.

Sources of Information

Portions of this article were excerpted from "Amaranth Research in Minnesota", BioOptions Vol. I(1) and from Montguide MT 8808, "Grain Amaranth: A Way to Diversify Your Farming Enterprise", November 88.

Ferdinand Kiehn, Agriculture Canada Research Station at Morden, also contributed to this article. Further information on amaranth can be found in the 1989 "Amaranth Grain Production Guide" available from the Amaranth Institute, P.O. Box 216, Bricelyn, MN 56014. Individual copies are $5.00 US.

February, 1990
Deanne Belisle

3M 02/90 ISSN 0840-9447